DOCUMENT RESUME

ED 237 966 CS 007 458

AUTHOR Bean, Thomas W.; And Others
TITLE Direct Instruction in Metacognitive Strategies: Cumulative Instruction in Summarization and Graphic Organizer Construction vs. Graphic Organizer Alone vs. an Outlining Strategy in 10th Grade World History. Technical Report No. 6.
INSTITUTION Learning from Text Project, Riverside, CA.
PUB DATE Nov 83
NOTE 27p.; Paper presented at the Annual Meeting of the California Reading Association (17th, Sacramento, CA, November 3-5, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Cognitive Processes; *Content Area Reading; *Critical Thinking; High Schools; *Learning Strategies; Readability; Reading Comprehension; Reading Research; *Student Attitudes; *Study Skills; Teaching Methods; World History
IDENTIFIERS *Graphic Organizers; *Outlining; Summarization

ABSTRACT

To compare both the effect of and the student attitude toward instruction in outlining and graphic organization, 72 grade 10 world history students were divided into three treatment groups. Two groups, one of which had previously received 14 weeks of summarization training, were instructed in a three-step procedure for creating a graphic organizer of history lesson concepts, while the third group generated traditional outlines on lesson information. Student scores on six multiple choice quizzes, the final one of which was administered after the 14-week strategy instruction period, were compared using one way analysis of variance. No significant differences emerged for the three groups on the first five quizzes, but on quiz six students in the graphic organizer group with summarization training achieved significantly higher scores than either of the other groups. This group also received significantly higher scores in a summarization exercise with text materials of college-level difficulty. A six-item Likert scale, administered to 68 students in the three groups, revealed that the two graphic organizer groups displayed significantly more positive attitudes toward the strategy they were taught than the outlining group. (MM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED237966

University of California and California State University
Joint Projects Steering Committee

Learning from Text

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Technical Report No. 6

Direct Instruction in Metacognitive Strategies: Cumulative Instruction in Summarization and Graphic Organizer Construction vs. Graphic Organizer Alone vs. an Outlining Strategy in 10th Grade World History[1]

Thomas W. Bean
Associate Professor
Reading Department
California State Univ.
Fullerton, CA 92634

Harry Singer
Professor
School of Education
Univ. of Calif.
Riverside, CA 92521

Jack Sorter
History Department
Garden Grove High School
Garden Grove, CA 92640

Charles Frazee
Professor
History Department
California State Univ.
Fullerton, CA 92634

Technical Report

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Harry Singer
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CS 007458

High school students possess a surprisingly limited repertoire of independent study strategies. In the middle grades they acquire some knowledge of formal outlining. This single strategy endures through high school and into college. Indeed, outlining and re-reading were the only two strategies mentioned when we queried 58 average and above average 10th graders about procedures they used to study world history (Bean, Singer, Sorter, & Frazee, in press). Students in public schools are not permitted to underline their borrowed texts but they are taught to outline in their English classes. Therefore, it came as no surpise that outlining was the preferred strategy.

Alternatives to outlining that are less rigid in structure and more vivid in depicting interrelationships among concepts have been available to teachers and students for quite some time. For example, Barron's (1969) graphic organizer which portrays text concepts in a visual hierarchy that is considerably less linear and formal than an outline has been recommended as a study aid in social studies (Lunstrum & Taylor, 1978; Thelen, 1982; Vaughan, 1982).

We were interested in comparing the effect of outlining instruction versus graphic organizer instruction on 10th grade students' comprehension of world history. In addition, we wanted to compare students' attitude toward the outlining and graphic organizer strategies, especially in terms of any desire they might express to use the strategy learned in other classes. Attitude strongly influences academic success and contributes to a comprehensive prediction of students' grade point average that enhances predictions based on achievement data alone (Bean & Singer, 1983; Carter, 1957).

Finally, the effectiveness of any study strategy is likely to covary with the difficulty of the text. Thus, we compared students instructed in outlining versus graphic organizer construction on a summarization task involving difficult world history text.

Before describing the design of our study, we want to briefly review previous outlining and graphic organizer research. Despite the historical prominence of outlining and its dominance as a study strategy known and used by students, relatively few studies have explored its efficacy.

Review of Research

In a comprehensive review of investigations comparing student-generated study aids, Anderson (1980) concluded that without explicit instruction in a procedure such as outlining, students do as well simply rereading text assignments. However, when students receive direct instruction in outlining or any similar study procedure, their comprehension and retention of information usually outpaces that of untrained peers. For example, in one of the few high school studies of outlining, Barton (1930) trained 96 high school students to skim paragraphs for main ideas and supporting details. He also taught them to delete trivial information. Barton's procedure parallels Kintsch and van Dijk's macrorules used in recent studies to teach summarization (Bean et al., in press; Day, 1980; McNeil & Donant, 1982). Students taught outlining achieved significantly higher test scores on social studies passages than a matched control group receiving similar instruction but without the outlining component.

Outlining has received little research attention since Barton's study despite its wide use by students in secondary classrooms. In contrast, graphic organizers have piqued the interest of researchers. Much of this research was reviewed and synthesized in a meta-analysis conducted by Moore and Readence (1980). Of the 16 studies considered in their analyses, only four involved a treatment condition where students constructed their own graphic organizers after reading. The average effect size for this treatment was .38 versus a very small effect of .15 for those studies where the graphic organizer was developed by the teacher and used as a pre-reading guide. Moore and Readence concluded that student-constructed graphic organizers were more likely to facilitate comprehension. Moreover, they suggested that high verbal ability students were most adept at learning and applying this independent study strategy.

The design of our study was predicated on the belief that student constructed outlines and graphic organizers would be most facilitative. However, we predicted that graphic organizers depicting interrelationships among text ideas would contribute more to students' understanding and retention than outlines that list concepts in a linear fashion.

Design

Materials and Procedures

Two classes of students comprised the experimental treatment groups. They were instructed in a three-step procedure for creating a graphic organizer of lesson concepts presented in their world history

text, Echoes of Time: A World History (Ostrowski & Kemper, 1977). The text had an average readability rating of 10th grade (Raygor, 1977). It presented ideas in a coherent superordinate to subordinate fashion which made it quite readable. Therefore, the first step in our three-step procedure for constructing a graphic organizer involved selection of a topic sentence that tied together subordinate ideas in a text passage. Step two asked students to develop a graphic organizer displaying interrelationships among ideas in the text. Finally, step three asked students to derive a generalization or concluding statement based on information depicted in their graphic organizers. These steps are based on Kintsch and van Dijk's (1978) macrorules for abstracting, integrating, and retaining concepts in long term memory. Bean et al. (1983) used similar steps in a previous study aimed at training 10th graders to summarize and generate questions about world history. Students in the first experimental group were the recipients of this earlier training while the second treatment group did not have previous experience with any learning from text strategy. Thus, the students in the first experimental group had prior experience in summarization rules plus instruction in constructing graphic organizers, the second experimental group had instruction only in use of graphic organizers.

The following example displays the graphic organizer instruction received by the two experimental groups. The first author walked students through a partially completed graphic organizer on a simple informational passage from their text. The passage was one that

students summarized in the previous study (Bean, et al., 1983). Thus, they could focus their attention on the process of graphic organizer construction rather than the content of the passage.

The Age of Discovery

What motivated the European countries to explore and expand their horizons?

One reason was the search for adventure. Europeans eagerly listened to and read tales about the journeys of travelers to the Orient, especially Marco Polo's overland trip to China in the thirteenth century. This stirred imaginations and desires for similar riches and glory.

A second reason was religion. Christianity in its first twelve centuries had already spread throughout southern, central, and northern Europe. Then during the period of the crusades, it had attempted to convert the Moslems in the Near East. Now, by the fifteenth century,Christian missionaries were looking for new arenas of conversion and were beginning to turn their energies toward Africa and Asia.

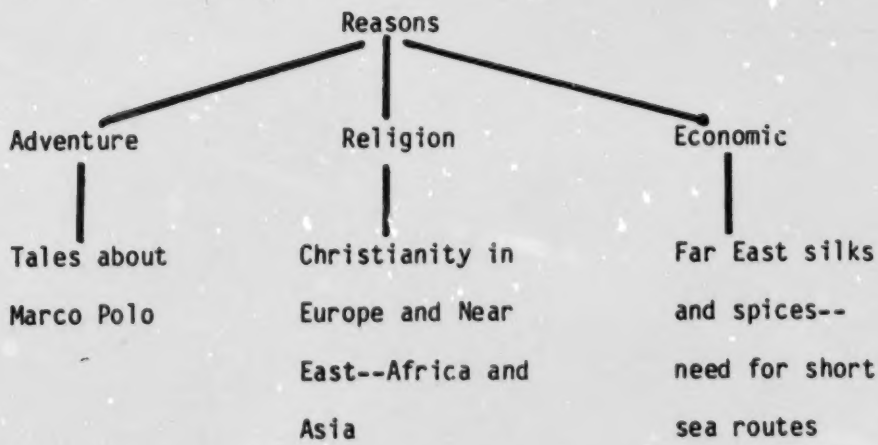
A third and, probably, the strongest reason for European exploration was economic. There was a great demand in Europe for the silks and spices of the Far East, but the overland routes to the Orient were controlled by the Moslems. Whichever country found the shortest sea route

would reap tremendous welath from the resulting trade. Then too, there was the desire to find gold and silver and precious stones--all of which were in short supply in Europe.

Using the three step procedure described earlier, students contributed ideas for the construction of a graphic organizer illustrated below.

Construction of a Graphic Organizer

1. Selection: Write the topic sentence.
   "What reasons motivated European countries to explore and expand their horizons?"
2. Diagram

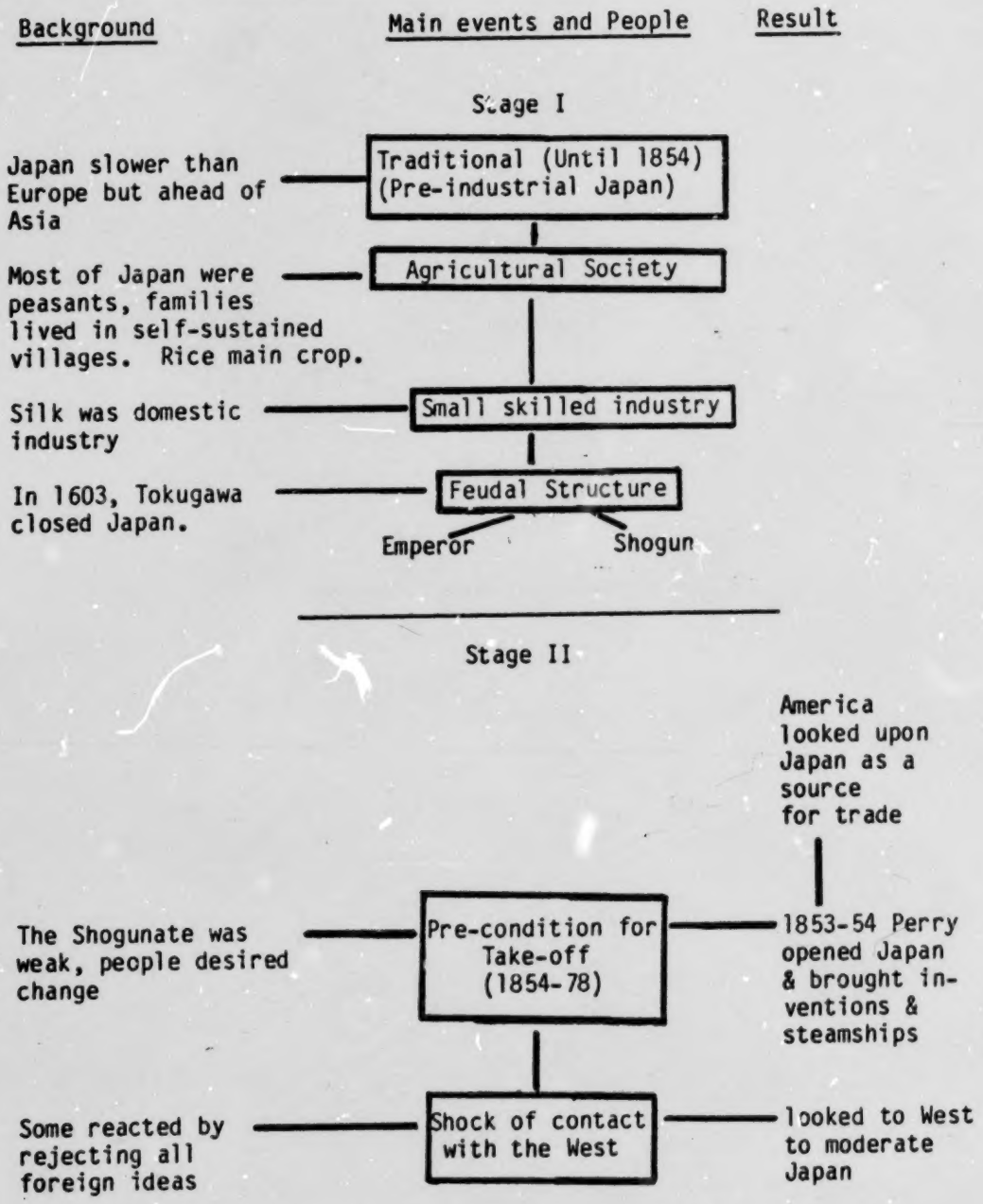


3. Generalization: Three major reasons motivated Europe to expand its horizons but the most important was exonomic trade.

Prior to this first instructional session, both the first author and the teacher read and discussed recent articles highlighting the use of graphic organizers (e.g. Vaughan, 1982). In addition, the teacher, Jack Sorter, experimented with the development of his own graphic organizers on various sections of the text. He discovered that a good procedure for generating a world history graphic organizer involved placing background information on the left, main events and people in the middle, and key results on the right side of the page. Students were encouraged to use this format for their graphic organizers.

Following the initial demonstration of graphic organizers, students engaged in guided practice developing a graphic organizer in small groups on their first reading assignment, "the roots of English government." These were evaluated by the teacher using a check plus, check,or check minus giving students feedback on their efforts to use the strategy. Thereafter students individually generated graphic organizers for each lesson and continued to receive teacher feedback. The following example is an excerpt from a student's graphic organizer on the Industrial Revolution in Japan. It represents a well-developed graphic organizer completed after about 12 weeks of instruction in the strategy.

Graphic Organizer on the Industrial Revolution in Japan


Background
Main events and People
Result
Stage I
Japan slower than Europe but ahead of Asia
Traditional (Until 1854) (Pre-industrial Japan)
Most of Japan were peasants, families lived in self-sustained villages. Rice main crop.
Agricultural Society
Silk was domestic industry
Small skilled industry
In 1603, Tokugawa closed Japan.
Feudal Structure
Emperor
Shogun
Stage II
America looked upon Japan as a source for trade
The Shogunate was weak, people desired change
Pre-condition for Take-off (1854-78)
1853-54 Perry opened Japan & brought inventions & steamships
Some reacted by rejecting all foreign ideas
Shock of contact with the West
looked to West to moderate Japan

A third group of students generated traditional outlines of lesson concepts. They used a three-step procedure modelled by the first author in the same sequence as the graphic organizer group. They simply generated an outline for step two rather than a graphic organizer. The following excerpt illustrates a typical student outline.

Growth of Industry in Japan

I. Pre-Industrial Japan
   A. Traditional Society (522-1854)
      1. Agricultural Society
         a. most Japanese were rice farmers
         b. most Japanese lived in self-sufficient villages
      2. Small scale industry
         a. silk production
         b. similar to domestic system in England
      3. Feudal Society
         a. figurehead emperor
         b. shogun had real power
         c. samurai were shogun's men
   B. Tokugawa Shogunate (1603-1868)

There were few discernible differences in individual student outlines or graphic organizers. They all stayed close to the structure of the text in selecting and depicting superordinate and subordinate information. Outlines tended to include more lower level detail than graphic organizers.

Comparison of the three groups involved the following dependent measures:

1. Six 15-item text explicit multiple-choice quizzes spanning four chapters of text or 19 lessons (i.e., over 156 pages of text reading with a range of five to 20 pages of text per lesson).
2. A Likert scale measuring students' attitude and self-reported future application of graphic organizers or outlining.
3. A delayed summarization task in more difficult text (i.e. Wallbank, Taylor, Carson & Mancall, 1969).

Subjects

Seventy-two 10th grade students enrolled in three sections of honors world history at Graden Grove High School participated in the study. They comprised a matched group of students based on a five item multiple-choice quiz appraising their prior knowledge of "the roots of English government," the first text reading assignment of the spring term, $F(2,69)=1.61$. The first graphic organizer group (n=25) achieved a mean of 2.56 with a standard deviation of .82. The second graphic organizer group (n=25) received a mean score of 2.68 with a standard deviation of .83. The outlining group (n=26) achieved the highest mean score of 3.0 with a standard deviation of 1.0. All three classes consisted of average and above average students. Thus, to the extent that prior knowledge is related to comprehension, the differences in treatment groups were biased against our hypothesis.

Results

Six 15-item multiple-choice quizzes comprised the first dependent measure. The sixth quiz was administered after the strategy had been phased-out to assess how many students would independently use the study strategy they were taught. Thus, we tested for maintenance of the strategies taught. Quiz items emphasized both macrolevel and microlevel concepts with more than half the questions focusing on superordinate ideas. Table 1 displays the quiz results for the six quizzes.

Table 1

Mean Scores on Six Fifteen-item Quizzes

Quiz	Content	Group	N	Mean	S.D.
1.	English Gov't	GP01	28	11.67	1.49
	F(2,75)=.89	GP02	26	12.15	2.03
		Out	24	11.45	2.12
2.	Parliament	GP01	24	11.87	2.27
	F(2,71)=2.98	GP02	24	10.83	3.23
		Out	26	12.61	2.13
3.	Cabinet-Modern Gov't	GP01	22	12.13	2.18
	F(2,62)=.98	GP02	23	11.21	2.25
		Out	20	11.70	2.13
4.	Industrial Revolution	GP01	28	13.75	1.45
	F(2,77)=.72	GP02	24	13.25	1.89
		Out	24	13.39	1.31
5.	Japan	GP01	27	12.81	1.75
	F(2,73)=.29	GP02	22	12.86	2.00
		Out	27	12.48	2.06
6.	Russia	GP01*	28	11.46	1.99
	F(2,72)=3.27(p<.05)	GP02	25	9.80	3.10
		Out	22	9.81	3.00

*GP0 phased-out

Quiz scores were compared using one-way analysis of variance. No significant differences ($p<.05$) emerged for the three groups on the first five quizzes. students in all three groups improved their performance slightly on succesive quizzes. They began missing an average of four items on the first quiz. By quiz five their error rate averaged three items. Thus, both graphic organizers and outlining served as equally effective strategies for deeply processing text concepts when students were required to use either strategy. However, we were also interested in exploring the degree to which students would use the strategy they learned and its effect on their comprehension when they were not required to use outlining or graphic organizers. Quiz six provided a measure of students' unprompted use of the strategy they learned.

On quiz six, students in the graphic organizer group that received 14 weeks of previous summarization and question-generation training achieved significantly higher quiz scores than the new graphic organizer and outlining groups, $F(2,72)=3.27(p<.05)$. Apparently previous training in how to selectively read and summarize world history tet gave the students in the first graphic organizer group an advantage that manifested itself in independent study reading.

A second dependent measure sought to appraise students' attitude toward outlining or graphic organizer construction. A six-item Likert

scale was constructed and administered to a total of 68 students in the three groups. The scale, reproduced below, focused on the degree to which students planned to use the strategy they learned in future classes. A total score of 30 was possible.

Name_____

Date_____Period_____

DIRECTIONS: Read each of the statements below. Circle the letter that best expresses your opinion using the following key:

SA = Strongly Agree
A = Agree
U = Undecided
D = Disagree
SD = Strongly Disagree

1. I learned a process for graphing ideas or listing key points that I plan to use in other classes.	SA	A	U	D	SD
2. I learned a process for graphing ideas or listing key points that can only be used in world history.	SA	A	U	D	SD
3. I learned a process for graphing ideas or listing key points that is no better than simply rereading.	SA	A	U	D	SD
4. I learned a process for graphing ideas or listing key points that I can use in college.	SA	A	U	D	SD
5. I learned a process for graphing ideas or listing key points that is no better than the one I was already using.	SA	A	U	D	SD
6. I learned a process for graphing ideas or listing key points that helped me remember world history material.	SA	A	U	D	SD

Students in the two graphic organizer groups displayed significantly more positive attitudes toward the strategy they were taught than the outlining group, $F(2,65)=6.57(p<.01)$. Means and standard deviations for the three groups are presented in Table 2.

Table 2

Mean Attitude Toward Strategy Learned Based on a Six-Item Likert Scale

Group	N	Mean	Standard Deviation
GPO1	24	23.33	3.39
GPO2	19	23.00	3.57
Out	25	19.68	4.43

A third dependent measure explored the effect of studying a difficult text passage using either outlining or graphic organizers in order to write a succinct summary. Since the first five quizzes resulted in no significant differences between outlining and graphic organizer groups on 10th grade world history text, we gave students a college level passage. We reasoned that graphic organizers might be most helpful to students in genuinely challenging material.

The selection we chose was a 919 word passage from Civilization Past and Present (Wallbank, Taylor, Carson, & Mancall, 1969). Its Raygor (1977) readability rating was college level. The passage dealt

with "interpretations of the Industrial Revolution including Toynbee's view and more recent theories. Technical vocabulary, concept density, and text structure were all complex as the following excerpt illustrates.

> In the early eighteenth century this Eotechnical phase began to be superseded by what is sometimes called the Paleotechnical phase, which was unique in its exploitation of new forms of energy and new raw material and which called for new forms of economic and social organization. (p. 164)

The opening section of the passage introduced background details concerning the 1700s. The main idea or gist of the passage is finally expressed in the last paragraph:

> The Industrial Revolution cannot properly be narrowed to any single aspect of the thoroughgoing reorganization of society that took place in the nineteenth century. The agrarian revolution--meaning enclosure and the extensive introduction of scientific in place of unscientific culture--that Toynbee insisted accompanied the Industrial Revolution, and the expanded use of nonhuman power were as essential--if not as spectacular--as the machines and the factory system. (p. 165)

Thus, in order to construct a succinct summary the reader had to improve upon the order of ideas as they were presented in the original passage. Simply following the original text structure would not allow for the selection of major ideas. Such a summary would tend to include supporting details without the major ideas that bind them together.

Students in each group were given 10 minutes to read the passage. They then had an additional 25 minutes to use the study strategy they had been taught (i.e. graphic organizers for two groups and outlining for the other group). Following this study time they were given 15 minutes to summarize the passage. Both their graphic organizer or outlining efforts and their summaries were collected for analysis.

Student summaries were first scored by the teacher using the following point system based on the teacher's expert summary of the passage.

A) Toynbee's views = 10 points

B) Modern view = 10 points

C) Mentioning that "many factors" causes the Industrial Revolution = 5 points

D) Economic History = 5 points

E) Mentioning the "thoroughgoing reorganization of society" resulting from the Industrial Revolution = 5 points

F) Background information on the 1970's (first paragraph = 1 point per item

Thus a student could achieve a total summary score in excess of 35 points though this would be unlikely in a short summary. Indeed, only one student received a score higher than 35; it was 37.

The first author scored a random sample of five summaries from each group. Interrater reliability for these 15 student summaries was .90. The teacher's scores for each group were then contrasted in a one-way analysis of variance. Table 3 provides the means and standard deviations for the three groups.

Table 3

Mean Summarization Scores on a College Level Passage Concerning the Industrial Revolution

Group	N	Mean	Standard Deviation
GP01	26	23.73	7.96
GP02	19	19.10	7.31
Out	20	17.40	8.56

The grapic organizer group with prior experience in summarization (Bean et al., in press) achieved a significantly higher mean score than the outlining group and the graphic organizer group using this strategy during the past 14 weeks, $F(2,62)=3.93(p<.05)$. Both graphic organizer groups achieved higher mean scores than the

outlining group although a post hoc Scheffe test revealed only a significant difference favoring the graphic organizer group with prior summarization training. The more recent graphic organizer group and the outlining group were not significantly different at the conventional level.

Thus, students who were able to use a graphic organizer to reconstruct the passage had an advantage over the outlining group. This advantage was significant if they had prior training in how to write a well-structured, succinct summary. An analysis of the effect produced by the graphic organizer treatment for this group yielded an eta coefficient of .33. This is a medium effect size comparable to findings in the small number of other studies exploring student constructed graphic organizers (Moore et al., 1980).

The advantage enjoyed by the group of students with prior summarization training becomes more apparent when their summaries are analyzed for length, a measure of succinctness (Bean et al., in press). Table 4 provides means and standard deviations on this measure.

Table 4

Mean Summarization Length on a College Level Passage Concerning the Industrial Revolution

Group	N	Mean	Standard Deviation
GP01	26	93.53	25.08
GP02	20	103.00	40.76
Out	19	118.84	38.12

Students with training in both summarization and 14 weeks of instruction in graphic organizer construction wrote more succinct summaries than the other two groups, $F(2, 62)=2.97(p<.10)$. Although this contrast did not reach significance at the conventional level the trend is apparent.

Student comments offered to the teacher just after completing the summarization task were also revealing. Students in the outlining group reported difficulty in deciding where to begin their summaries. Since their outlines follow rather than reconstruct the passage, this problem is not surprising. The graphic organizer scheme portraying background information, major events, and results used by the other two groups encouraged greater analysis of the passage and facilitated summary writing.

Discussion

Two groups of 10th graders who received direct instruction in graphic organizer construction successfully expanded their limited repertoire of study strategies beyond outlining. The group with previous training in summarization and question-generation (Bean et al., in press) outperformed a second graphic organizer group and an outlining group on quiz six. Students prepared for this quiz without teacher prompting to use the strategy they were taught. The group with previous training also achieved significantly higher scores than

the other two groups on a summary task involving a difficult, college-level passage.

These findings led us to conclude that systematic instruction in graphic organizer construction was beneficial for both groups of average and above average 10th graders. It was most beneficial for the group with previous metacognitive training. Students in this group became adept at using graphic organizers to independently study and summarize challenging history text.

The success of the first group is directly related to the systematic nature of the instruction they received and their prior training in summarization. Using an explicit, rule-governed procedure based on Kintsch and van Dijk's (1978) macrorules for text comprehension allowed us to improve upon earlier efforts aimed at teaching students to construct graphic organizers (Moore & Readence, 1980). Students developed an awareness of text structure features that contributed to their graphic representations of historical events and, more importantly, the results of these events. Rather than simply listing major ideas and subordinate details in a linear outline, students in the graphic organizer groups had to sort and reconstruct text concepts in order to depict their interrelationships. This process required higher order thinking and, as a consequence, encouraged integration, retention, and retrieval of text concepts. In contrast, outlining may encourage lower level rehearsal or rote memorization of text information.

The power of systematic instruction in a process for visually reconstructing text concepts has also been demonstrated with below average students. Geva (1983) used explicit instruction in text structure signal words that foreshadow causal relations (e.g., "due to, because" etc.) to teach less able community college students paragraph flowcharting. They became skilled at flowcharting causal relations in paragraphs with subsequent improvement in their reading comprehension.

The duration of metacognitive instruction received by the first group also contributed to their ability to apply this strategy successfully. Most training studies in metacognition run a few days, or at best, a few weeks (e.g. Adams, Carnine, & Gersten, 1982). We found that teaching average and above average students a complex metacognitive process for selectively reconstructing text concepts using graphic organizers takes at least 14 weeks. This time frame includes teacher modelling, small group and individual application with frequent feedback, and finally, unprompted application of the strategy. Our initial study (Bean et al., 1983) confirmed our presumption that it would take a long instructional time period to modify secondary students' ingrained study habits. In that study we taught students to summarize text information. The current study on graphic organization taught the same students to perceive relationships among the information that would constitute their summarization. Use of these two strategies had a complementary effect. Thus, the group with a full prior semester of metacognitive

instruction in summarization benefited most from subsequent instruction in graphic organizers. We were not surprised at this cumulative effect of metacognitive instruction. When we began our series of studies we formulated the hypothesis that students had to learn a series of strategies, each would require several weeks or months to learn, and effect of the strategies would be cumulative.

Each instructional treatment was done under controlled conditions and evaluated separately. This procedure provided a way of evaluating treatments over the long term duration required for learning a series of complex strategies. We intend to continue to use it as a model for our future research on cumulative learning of metacognitive strategies.

Finally, students in the graphic organizer groups displayed a significantly more positive attitude toward the strategy they learned than the outlining group. Secondary students are eager to expand their metacognitive strategies. Indeed, two of the students in the first graphic organizer group reported using this strategy in their biology class, especially on difficult sections of the text. This unprompted, independent effort to transfer the use of graphic organizers to other content areas suggests that when students have adequate time for learning a complex strategy, they are more likely to be able to learn it so well they can apply it in a novel situation.

References

Adams, A., Carnine, D., & Gersten, R. Instructional strategies for studying content area texts in the intermediate grades. Reading Research Quarterly, Fall, 1982, 18, 27-55.

Anderson, T. H. Study strategies and adjunct aids. In Rand J. Spiro, Bertram C. Bruce & William F. Brewer (Eds.), Theoretical Issues in Reading Comprehension. Hillsdale, NJ: Lawrence Erlbaum Associates, 1980, 483-502.

Barron, R. F. The use of vocabulary as an advance organizer. In Harold L. Herber & Peter L. Sanders (Eds.), Research in Reading in the Content Areas: First Year Report. Syracuse, NY: Syracuse University Press, 1969.

Barton, W. A. Jr. Outlining as a Study Procedure. New York, NY: Columbia University Bureau of Publications, 1930.

Bean, T. W. & Singer, H. Predicting freshman achievement in the UC and CSU systems. The California Reader, 1983, 16, 29-32.

Bean, T. W., Singer, H., Sorter, J., & Frazee, C. Acquisition of summarization rules as a basis for question generation in learning from expository text at the high school level. In Jerome A. Niles (Ed.), Searches for Meaning in Reading/Language Processing and Instruction. Thirty-Second Yearbook of the National Reading Conference. Blacksburg, VA: Virginia Polytechnic Institute and State University, 1983.

Carter, H. D. Manual of the California Study Methods Survey. Monterey, CA: CTB/McGraw-Hill, 1957.

Day, J. D. Training Summarization Skills: A Comparison of Teaching Methods. Unpublished doctoral dissertation, University of Illinois, 1980.

Geva, E. Facilitating reading comprehension through flowcharting. Reading Research Quarterly, Summer, 1983, 18, 384-405.

Kintsch, W. & van Dijk, T. A. Toward a model of text comprehension and production. Psychological Review, 1978, 85, 363-394.

Lunstrum, J. P. & Taylor, B. L. Teaching Reading in the Social Studies. Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills, 1978.

McNeil, J. & Donant, L. Summarization strategy for improving reading comprehension. In Jerome A. Niles & Larry A. Harris (Eds.), New Inquiries in Reading Research and Instruction. Thirty-First Yearbook of the National Reading Conference. Rochester, NY: National Reading Conference, 1982, 215-219.

Moore, D. W. & Readence, J. E. A meta-analysis of the effect of graphic organizers on learning from text. In Michael L. Kamil & Alden J. Moe (Eds.), Perspectives on Reading Research and Instruction. Twenty-Ninth Yearbook of the National Reading Conference, Washington, DC: National Reading Conference, 1980.

Ostrowski, R. & Kemper, J. Echoes of Time: A World History. New York, NY: McGraw-Hill, 1977.

Raygor, A. L. The Raygor Readability Estimate: A quick and easy way to determine difficulty. In P. D. Pearson (Ed.), Reading: Theory, Research, and Practice. Twenty-Sixth Yearbook of the

National Reading Conference, 1977, 259-263.

Theler, J. Preparing students for content assignments. Journal of Reading, 1982, 25, 544-549.

Vaughan, J. L. Use the ConStruct procedure to foster active reading and listening. Journal of Reading, 1982, 25, 412-422.

Wallbank, T. W., Taylor, A. M., Carson, G. B., & Mancall, M. Civilization Past and Present. Glenview, IL: Scott, Foresman and Co., 1969.